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Hamada et al.

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(54) **SLIDER FOR SLIDE FASTENER**

(75) Inventors: **Yoshikazu Hamada**, Toyama (JP); **Keiichi Keyaki**, Toyama (JP)

(73) Assignee: **YKK Corporation** (JP)

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(52) **U.S. Cl.**
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See application file for complete search history.

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Primary Examiner — Robert J Sandy
Assistant Examiner — Michael Lee
(74) *Attorney, Agent, or Firm* — Kilpatrick Townsend & Stockton LLP

(57) **ABSTRACT**

There is provided a slider for a slide fastener. A lock member is swingably supported by a pillar portion which is erected on an upper surface of a body. A cover member covers the pillar portion and the lock member from above. The lock member includes a body portion which is disposed on the upper surface of the body and a claw portion which protrudes from the body portion and enters an element guide path of the body. One side surface of the claw portion is formed with an inclined surface which causes the claw portion to be gradually tapered toward a front end of the claw portion. The other side surface of the claw portion is formed with a stepped portion which causes a plate thickness of the claw portion to be smaller than a plate thickness of the body portion.

4 Claims, 12 Drawing Sheets

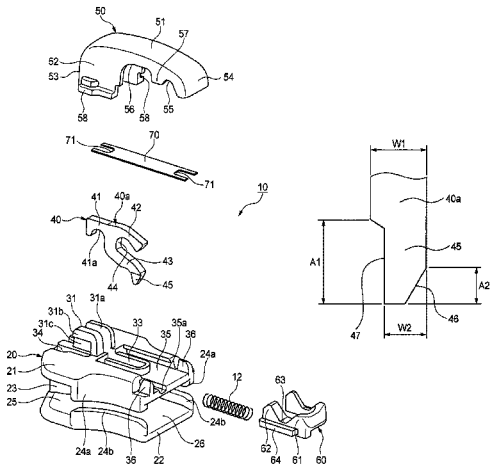

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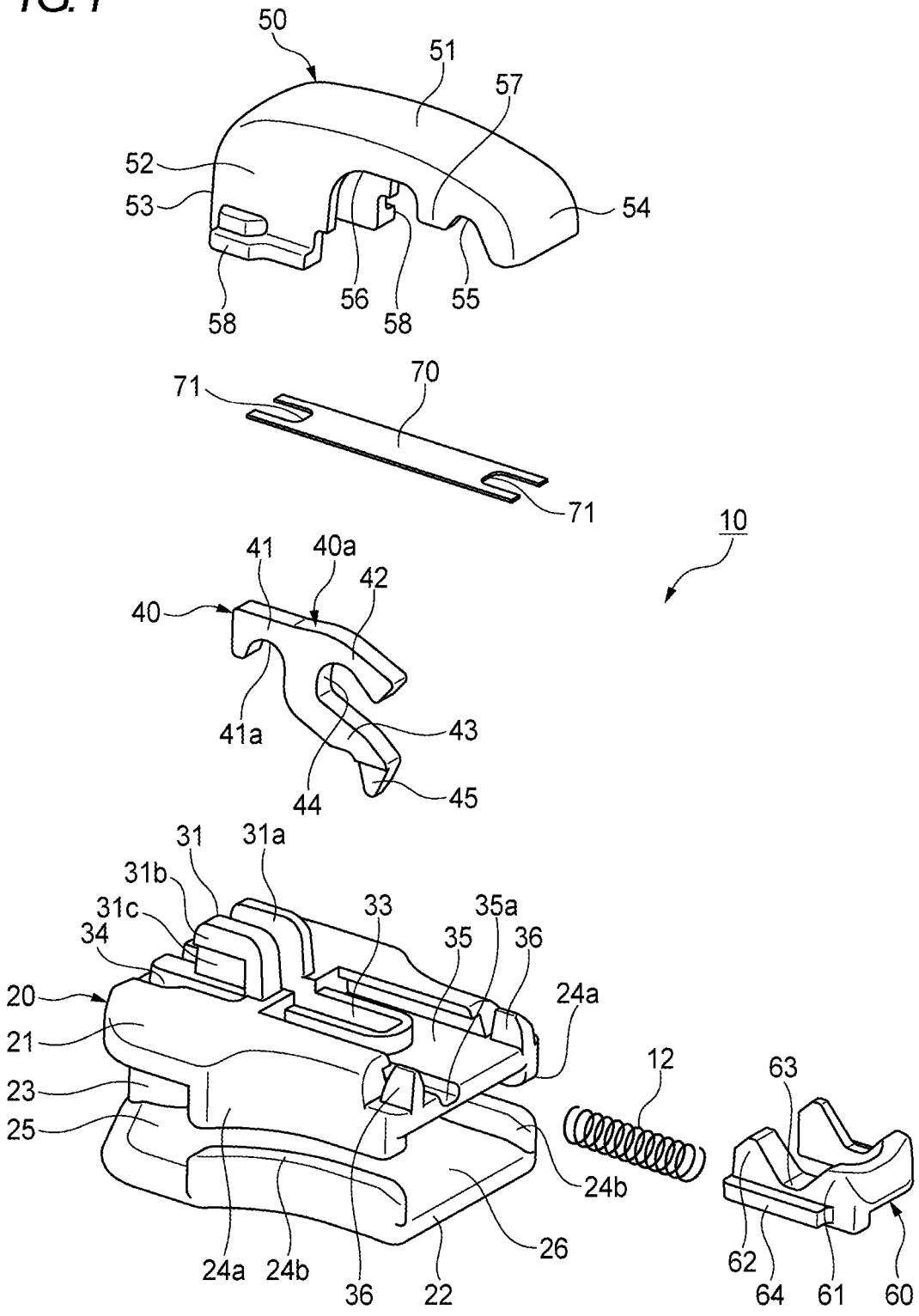
FIG.1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71
70
71
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40a
42
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41a
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44
45
31
31a
31b
31c
33
35a
34
35
36
20
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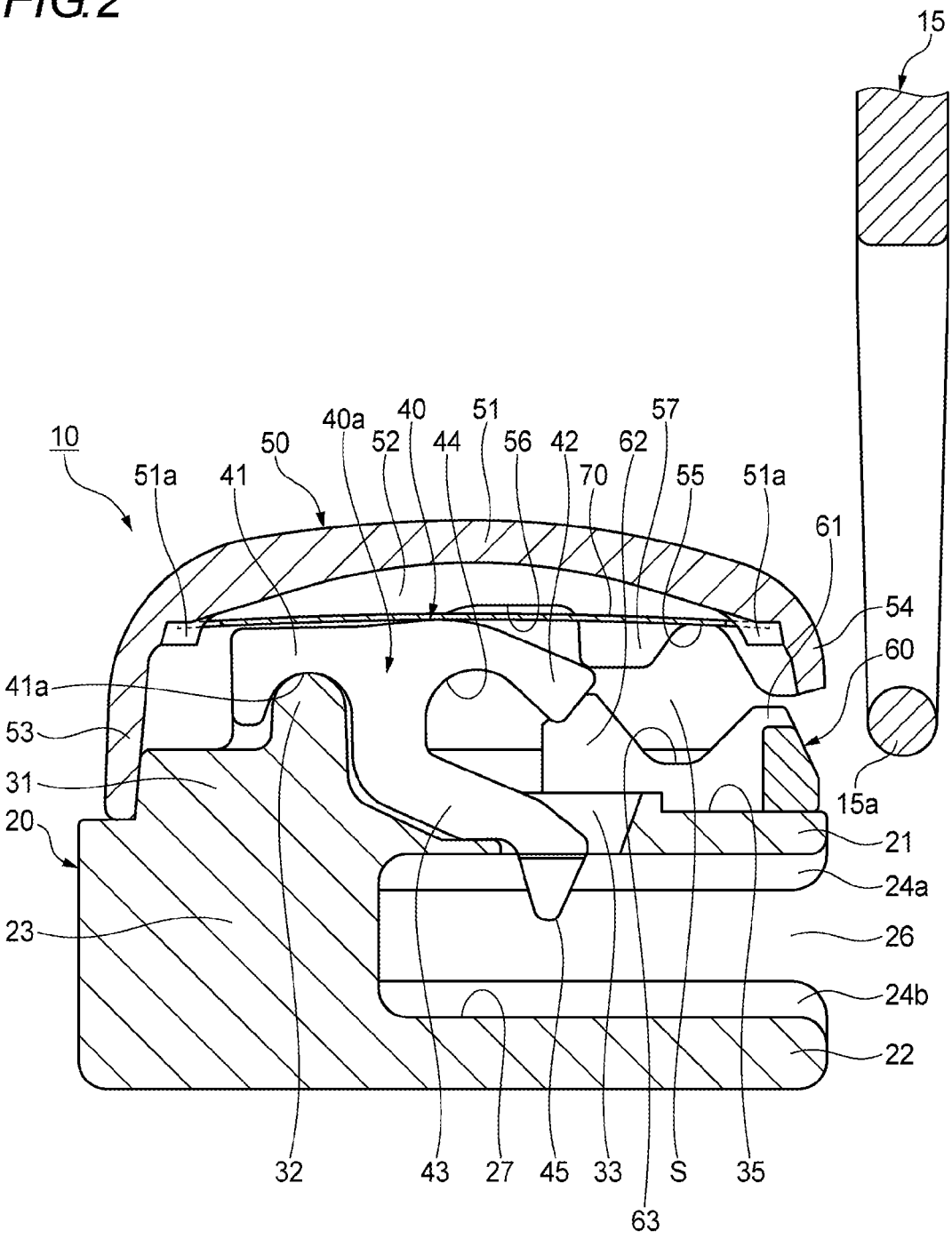
24b
24a
24b
36
22
26
62
64
61
60

FIG.2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44
51
56
42
70
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51a
61
54
60
15a
41a
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32
43
27
45
33
63
S
35

FIG.3

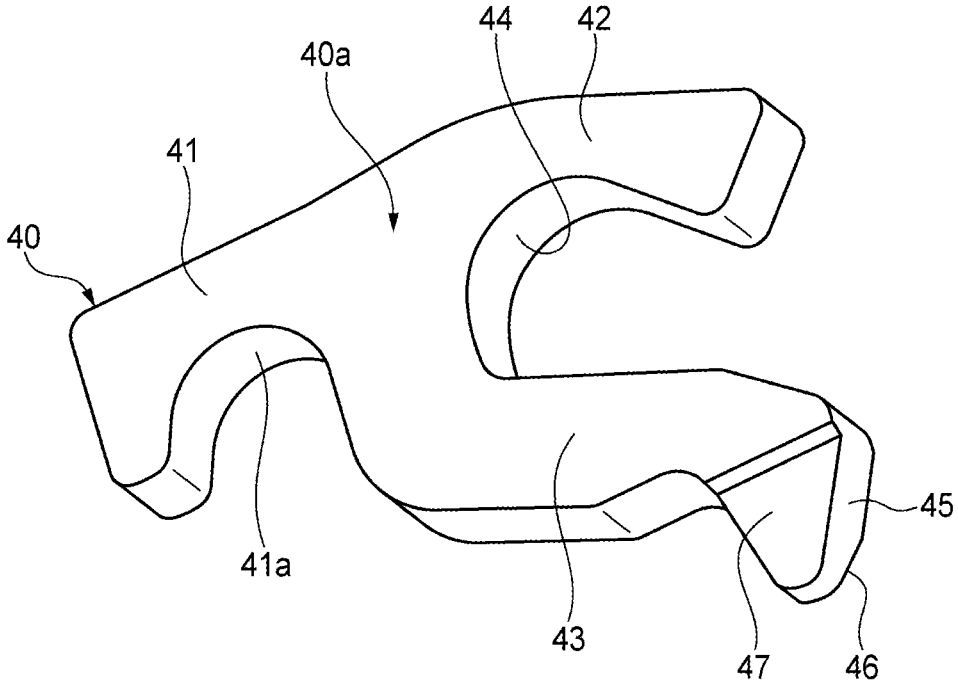


FIG.4

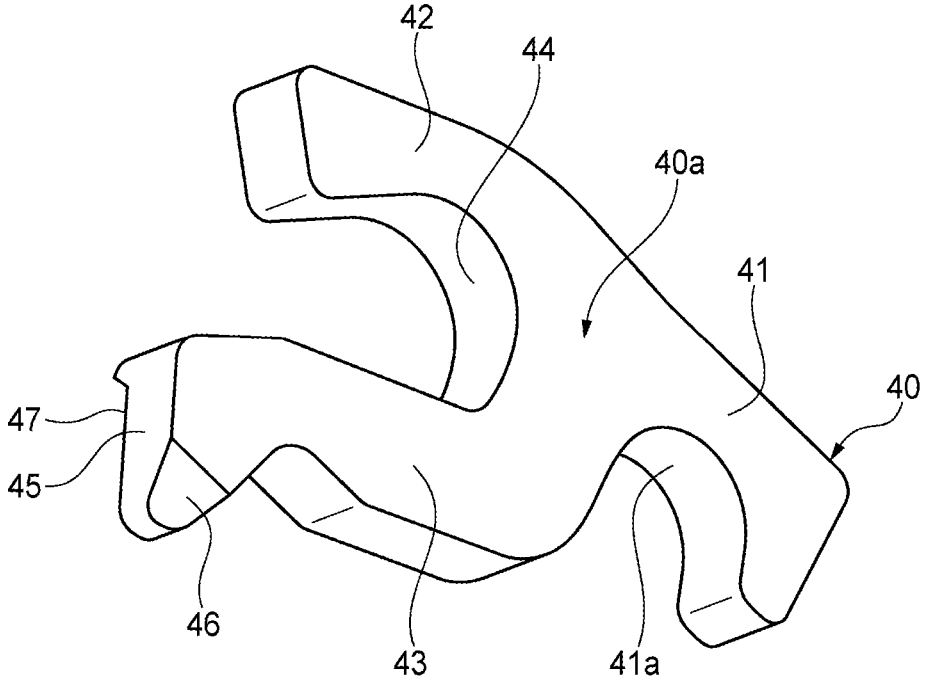
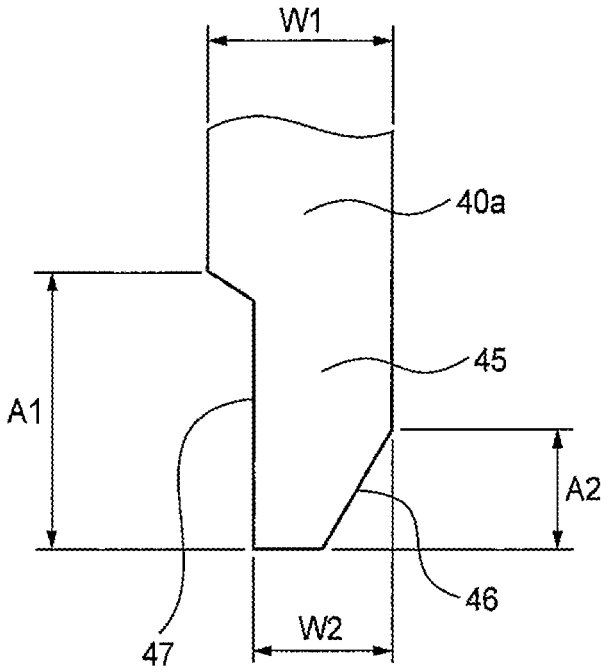


FIG.5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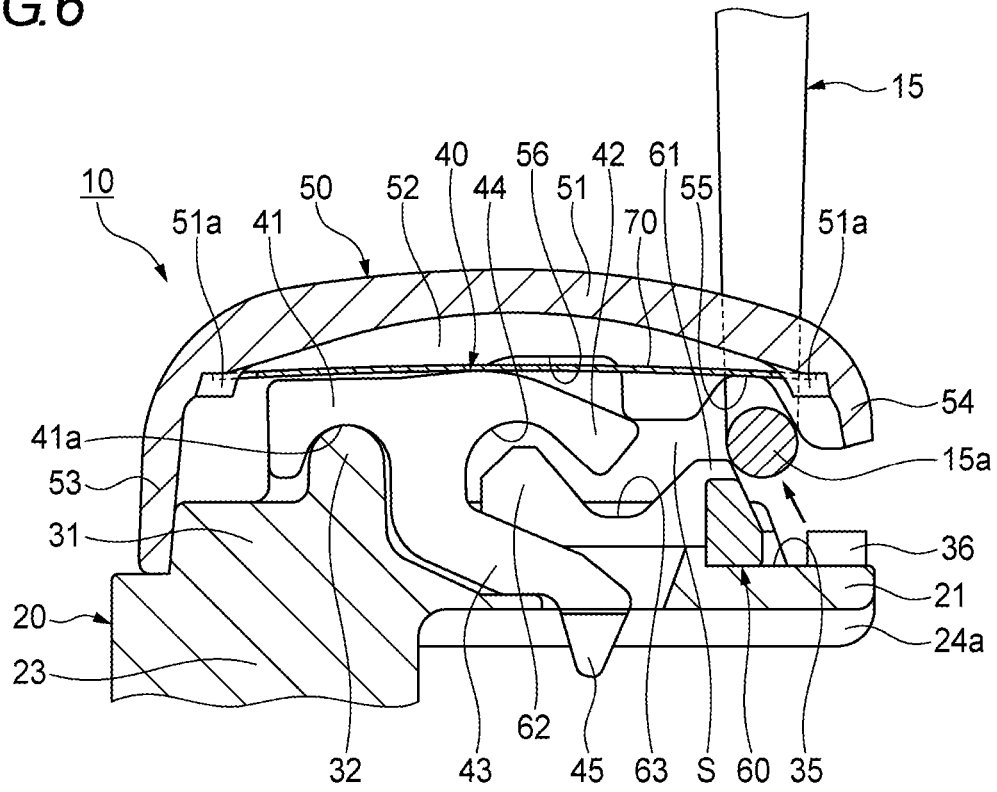
40a
45
A1
A2
46
47
W2

FIG.6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51a
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43
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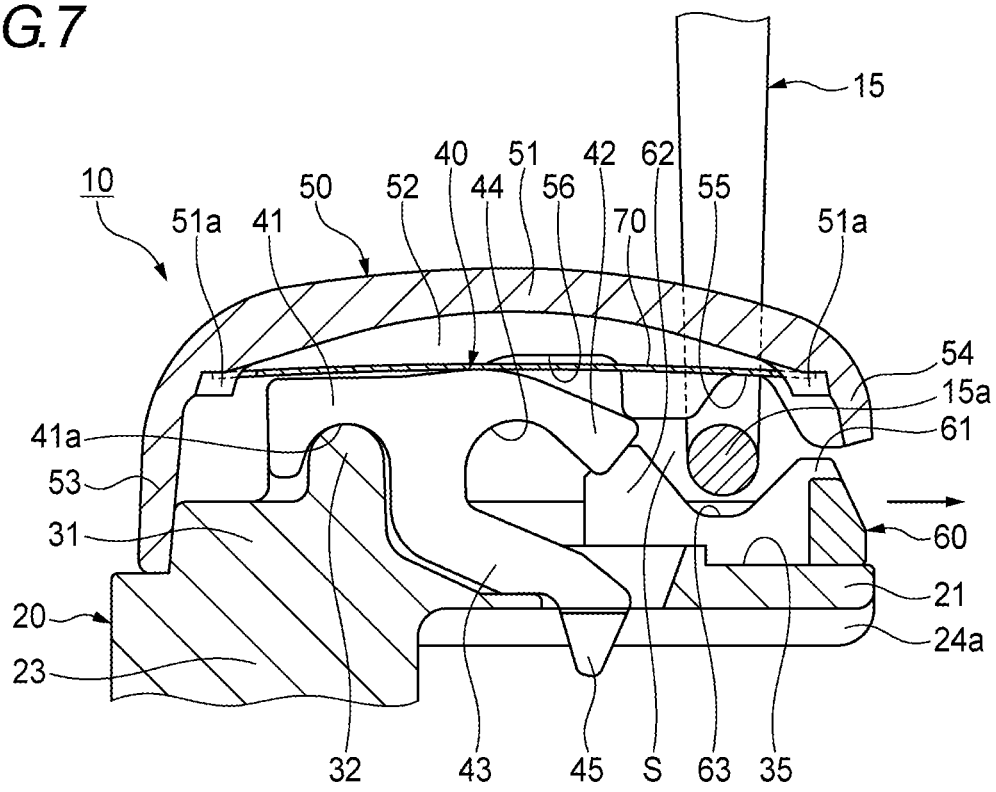
63
S
60
35

FIG.7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23
32
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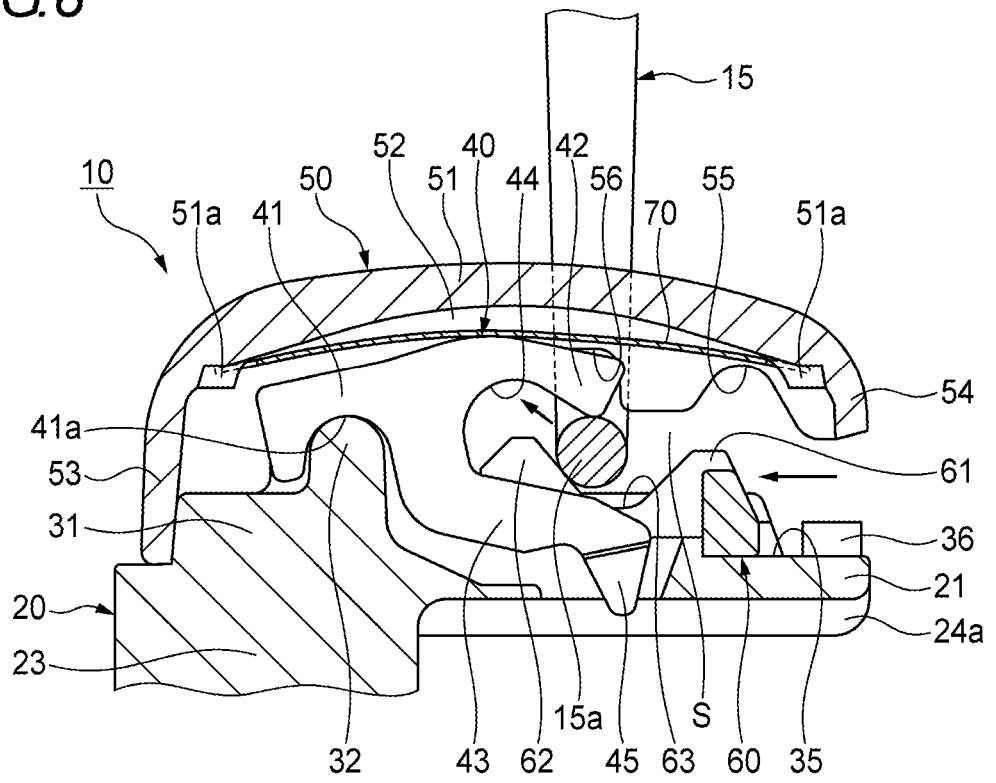
45
S
63
35

FIG.8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60
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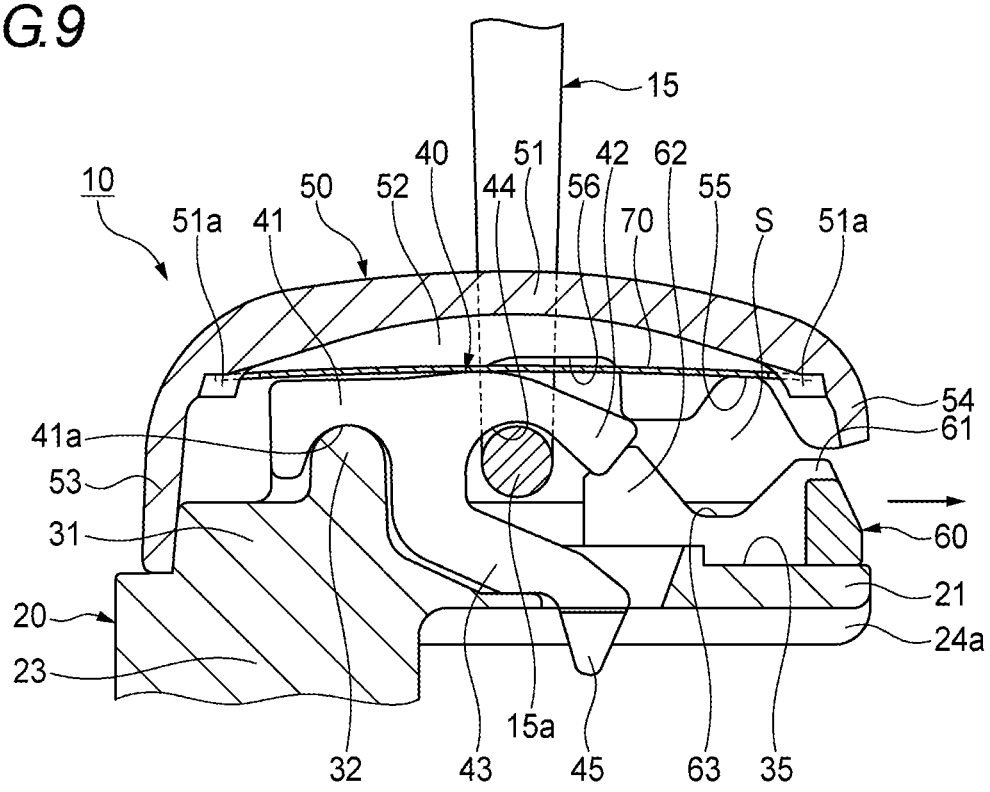
FIG.9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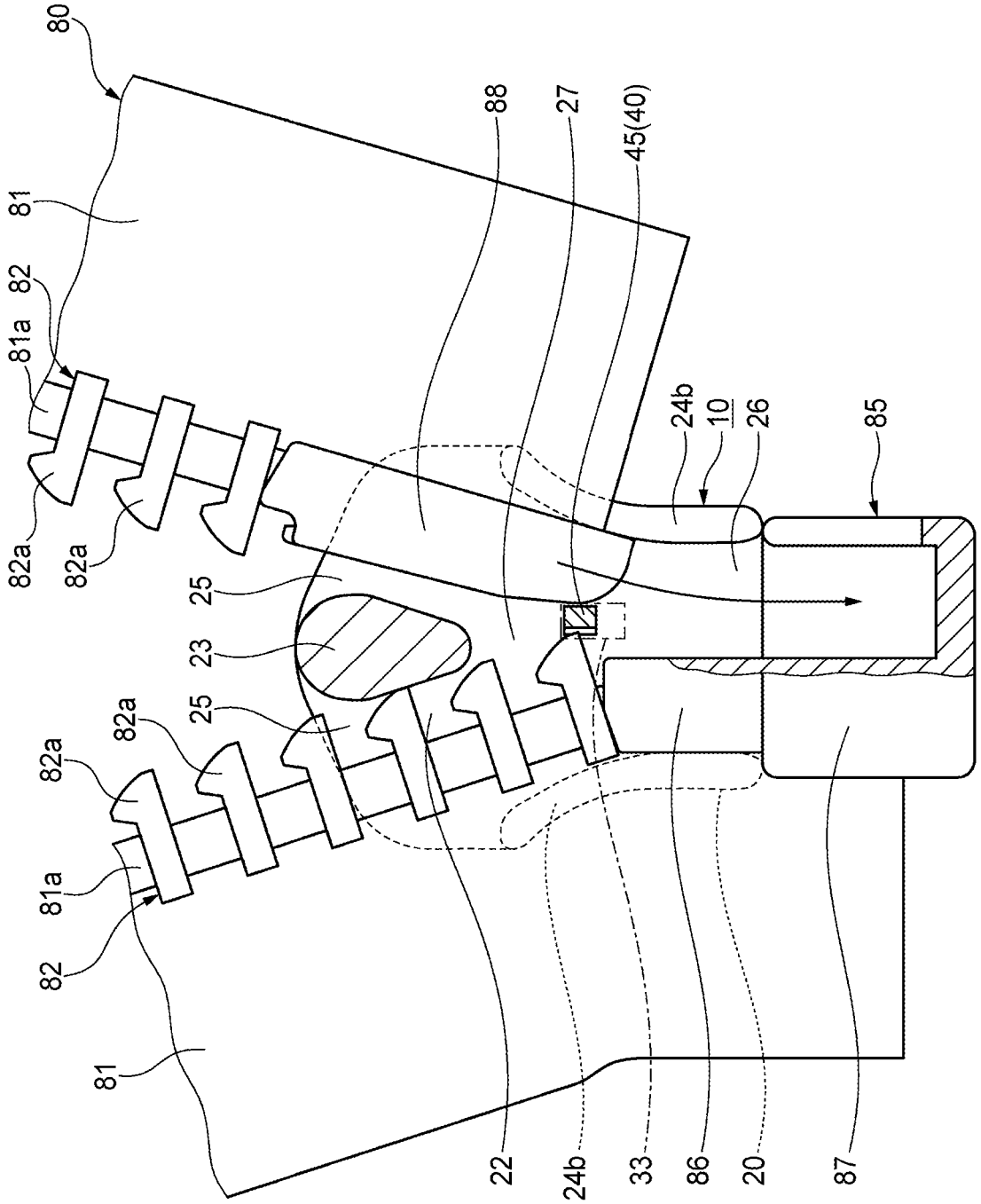
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82a
82a
81a
82
81
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45(40)
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22
24b
33
86
20
87

FIG.10

FIG.11

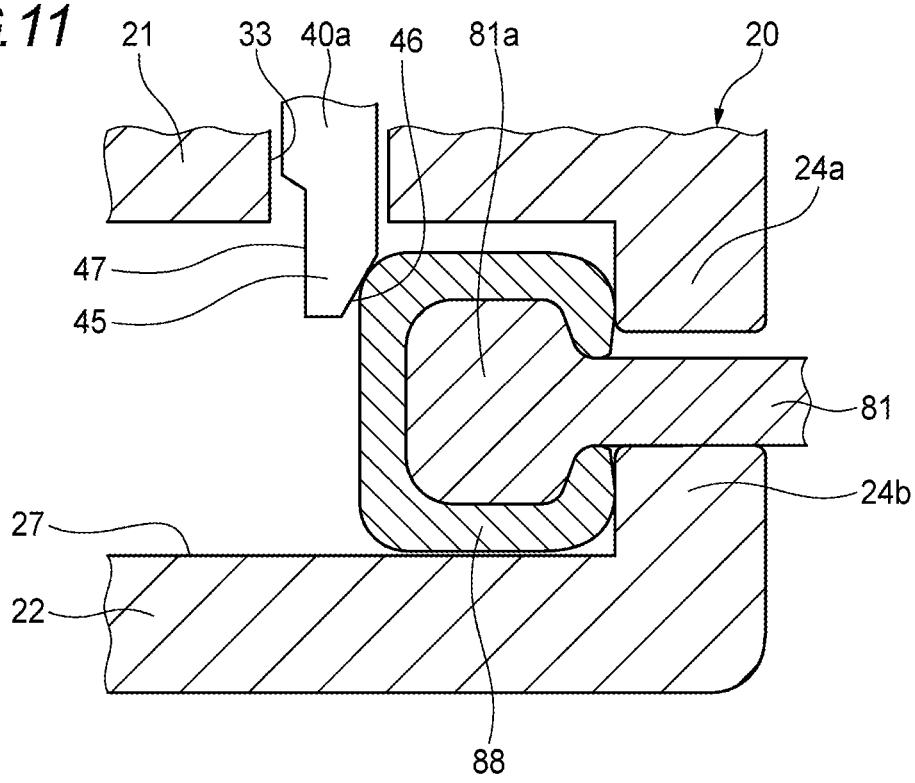
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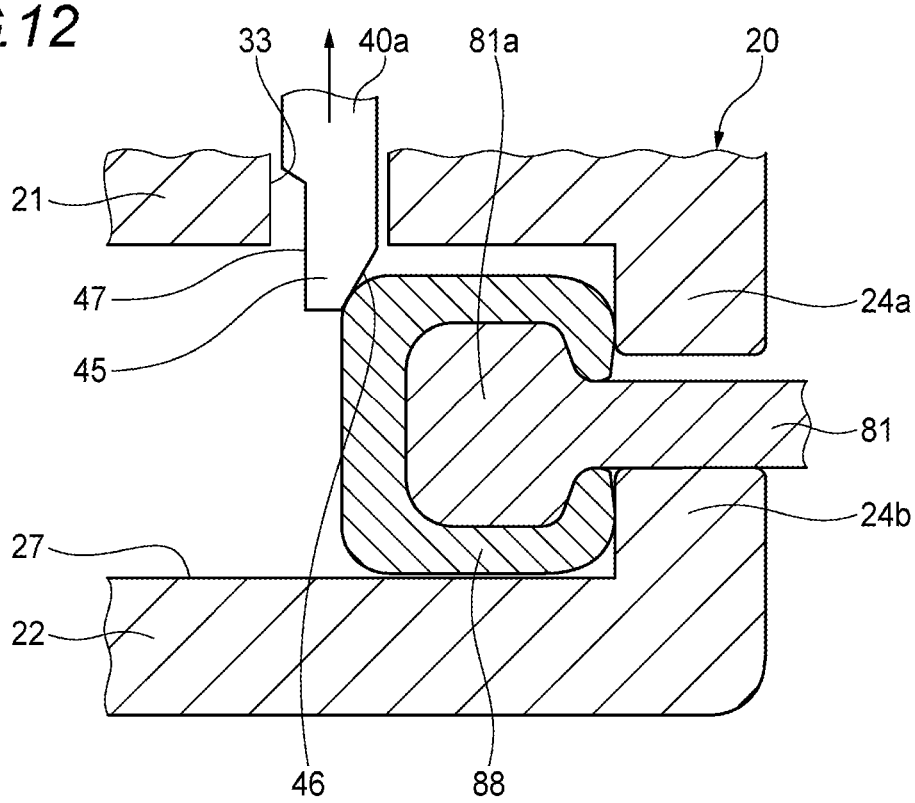
FIG.12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24b
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46
88

FIG.13

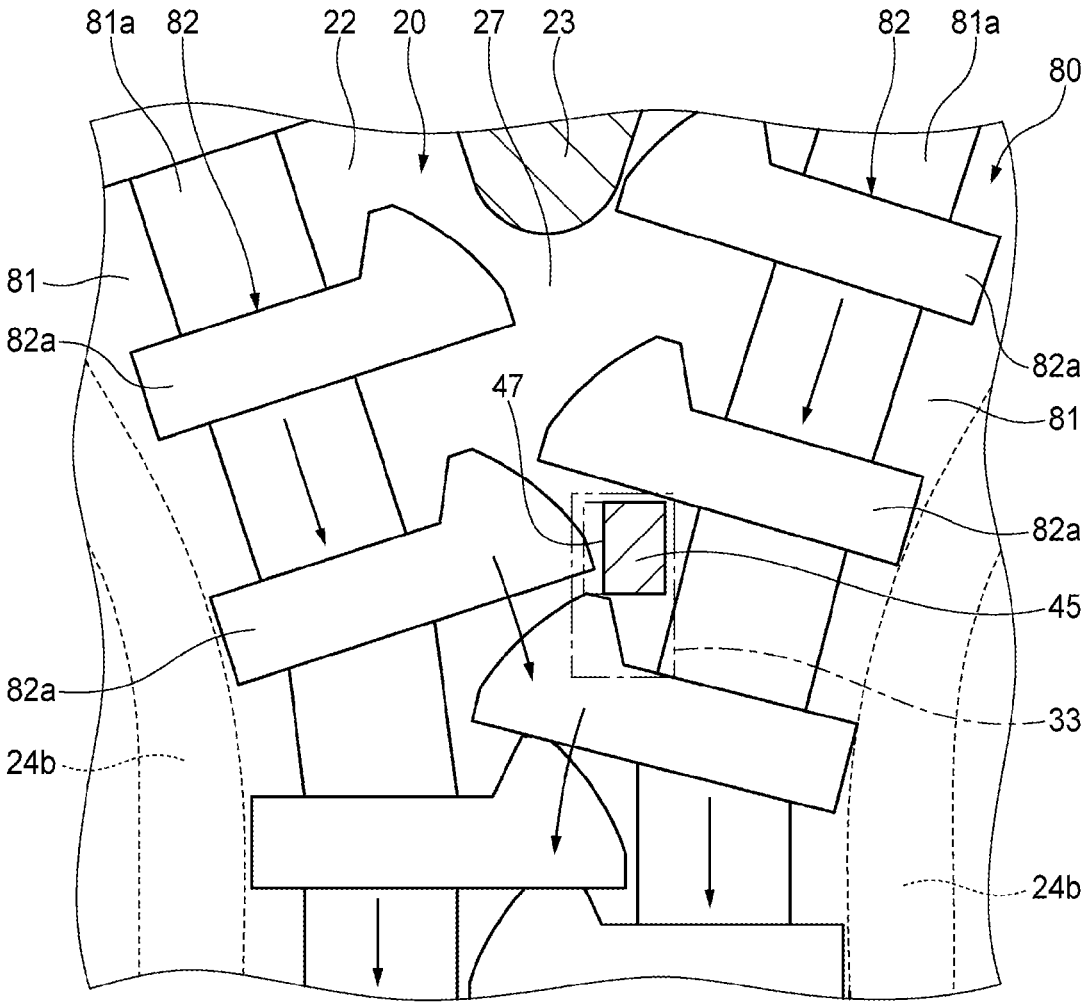
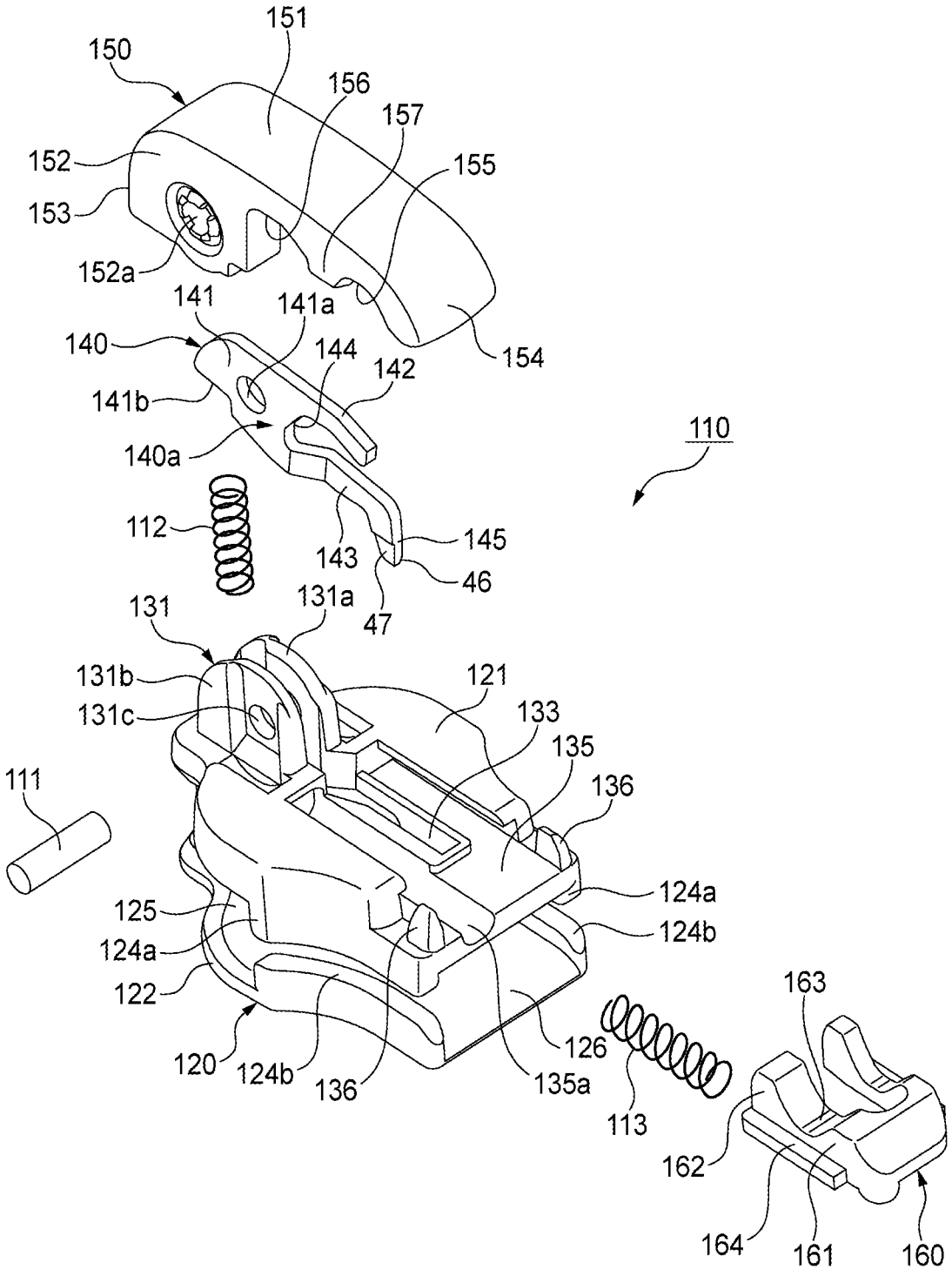


FIG.14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131a
131b
121
131c
133
135
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135a
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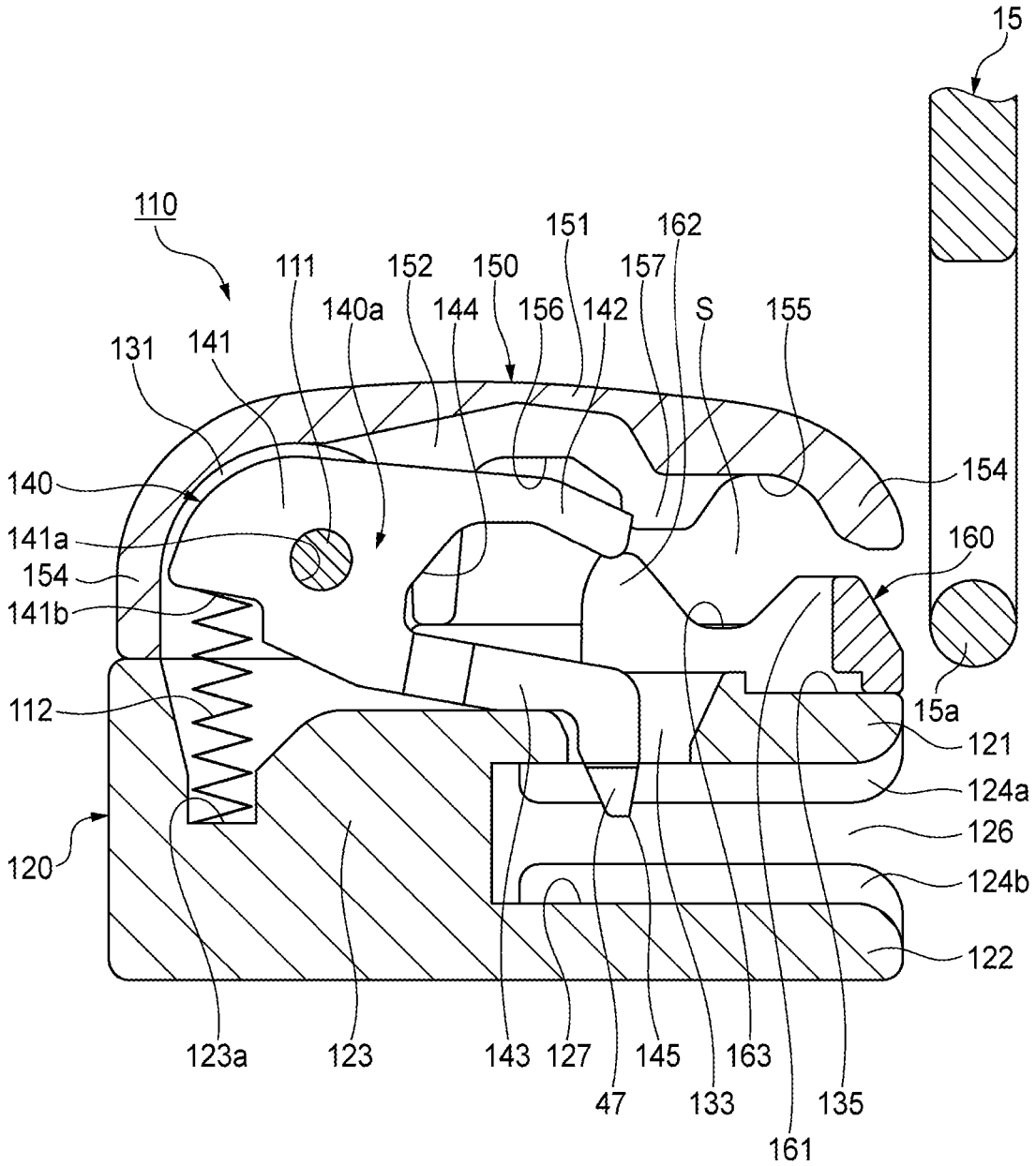
FIG.15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141b
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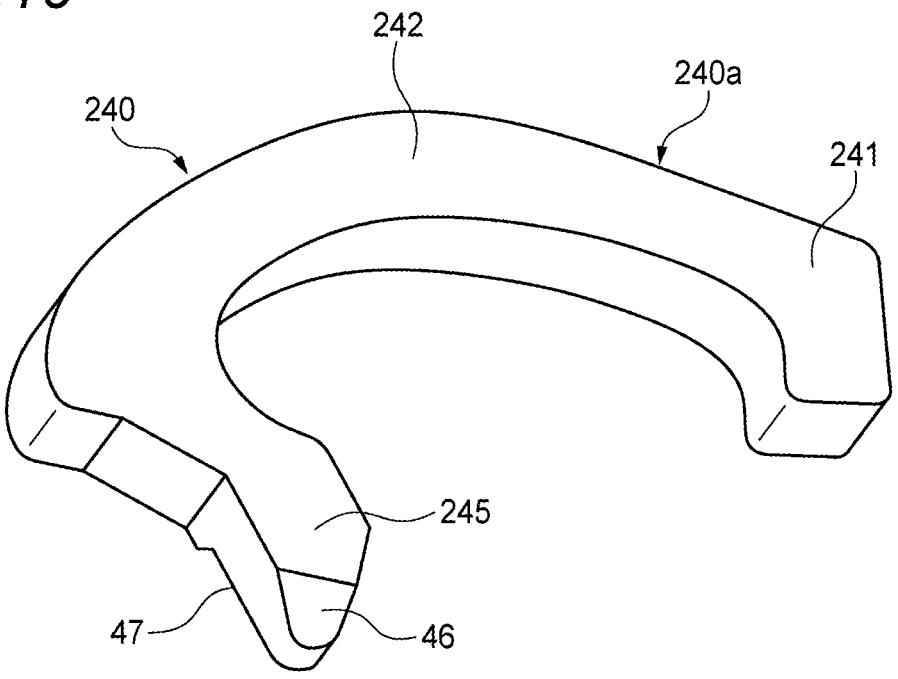
FIG.16



SLIDER FOR SLIDE FASTENER

This application is a national stage application of PCT/JP2011/060279 which is incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to a slider for a slide fastener, and more particularly, to a slider for a slide fastener with an automatic stop function.

BACKGROUND ART

In the related art, a slider for a slide faster includes a body, a lock member which is swingably supported by the body, a cover member attached to the body in a cantilever manner, with a front end portion thereof being fixed to the upper surface of the body, an opening/closing member which is slidably provided in the body so as to open/close a gap formed between a rear end portion of the cover member and an upper blade of the body, and a coil spring which urges the opening/closing member toward a position where the gap is closed, and a pull-tab is detachably maintained between the body and the cover member (e.g. refer to Patent Document 1).

PRIOR ART DOCUMENT

Patent Document

Patent Document 1: Japanese Patent Application Publication No. 2008-228808A

SUMMARY OF INVENTION

Problems to be Solved by Invention

As a slide fastener for opening and closing right and left front body portions, a slide fastener with a separable end stop having a box pin and insert pin at the end portions of fastener element rows is used. In a case where the slider for slide fastener disclosed in Patent Document 1 is attached to the slide fastener with the separable end stop, in order to improve the operability for closing the separable end stop, the insert pin may be provided with an inclined surface on the front end portion thereof such that a claw portion of the lock member is pushed up when the insert pin of the separable end stop is inserted into the slider. However, if the insert pin is provided with the inclined surface, the thickness of the insert pin is reduced, there is the possibility that the strength of the insert pin may vary.

In addition, in the slider for slide fastener disclosed in Patent Document 1, when the claw portion of the lock member is engaged with fastener elements, it is required to insert the claw portion between a gap between the right and left fastener element rows to be engaged. However, it is difficult to insert the claw portion since this gap is narrow. In addition, when engaging the right and left fastener elements in the process of finishing the slide fastener, there is required a lock-releasing device which pushes up the lock member so that a fastener element which does not engage with the claw portion of the lock member does not contact the claw portion of the lock member. This consequently increases the manufacturing cost of the slide fastener.

Accordingly, the present invention has been made keeping in mind the above problems, and an object of the present invention is to provide a slider for a slide fastener in which a claw portion of a lock member can be pushed up when inserting an insert pin into the slider without providing an inclined surface in the insert pin and right and left fastener elements can be engaged with each other without providing a lock-releasing device.

Means for Solving Problems

The object of the present invention is achieved by the following configurations.

(1) A slider for a slide fastener including: a body; a lock member which is swingably supported by a pillar portion which is erected on an upper surface of the body; and a cover member which covers the pillar portion and the lock member from above, wherein the lock member comprises a body portion which is disposed on the upper surface of the body and a claw portion which protrudes from the body portion and enters an element guide path of the body, wherein one side surface of the claw portion is formed with an inclined surface which causes the claw portion to be gradually tapered toward a front end of the claw portion, and wherein the other side surface of the claw portion is formed with a stepped portion which causes a plate thickness of the claw portion to be smaller than a plate thickness of the body portion.

(2) The slider for a slide fastener according to (1), wherein a formation area of the stepped portion is greater than a formation area of the inclined surface in a protruding direction of the claw portion.

(3) The slider for a slide fastener according to (1) or (2), wherein the inclined surface comes into contact with an insert pin of a separable end stop of the slide fastener, so that the claw portion is pushed up.

(4) A slider for a slide fastener including: a body; a lock member which is swingably supported by a pillar portion which is erected on an upper surface of the body; and a cover member which covers the pillar portion and the lock member from above, wherein the lock member comprises a claw portion which enters an element guide path of the body, and wherein one side surface of the claw portion is formed with an inclined surface which comes into contact with an insert pin of a separable end stop of the slider fastener so that the claw portion is pushed up.

Advantageous Effects of Invention

According to the slider for a slide fastener according to the present invention, since the one side surface of the claw portion is formed with the inclined surface which causes the claw portion to be gradually tapered toward the front end of the claw portion, when inserting the insert pin of the separable end stop into the slider, the insert pin comes into contact with the inclined surface so as to push up the claw portion. Thus, it is possible to improve the operability for closing the separable end stop.

In addition, since the other side surface of the claw portion is formed with the stepped portion which causes the plate thickness of the claw portion to be smaller than the plate thickness of the body portion, it is possible to prevent the claw portion from contacting the fastener elements of the slide fastener, which do not engage with the claw portion. Consequently, it is possible to engage the right and left fastener elements with each other without providing the lock-releasing device, thereby reducing the manufacturing cost of the slide fastener.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is an exploded perspective view illustrating a first embodiment of a slider for a slide fastener according to the present invention;

FIG. **2** is a vertical cross-sectional view of the slider for a slide fastener shown in FIG. **1** in a state in which a pull-tab is not mounted;

FIG. **3** is a perspective view of the lock member shown in FIG. **1**, viewed from the left side;

FIG. **4** is a perspective view of the lock member shown in FIG. **1**, viewed from the right side;

FIG. **5** is an enlarged rear view of the claw portion shown in FIG. **1**;

FIG. **6** is a vertical cross-sectional view of the slider illustrating a state in which a shaft portion of the pull-tab is pushed into an insert gap;

FIG. **7** is a vertical cross-sectional view of the slider illustrating a state in which the shaft portion of the pull-tab is inserted into a valley portion of an opening/closing member;

FIG. **8** is a vertical cross-sectional view of the slider illustrating a state in which the shaft portion of the pull-tab is further inserted into the insert gap;

FIG. **9** is a vertical cross-sectional view of the slider illustrating a state in which the shaft portion of the pull-tab is accommodated in an operation recess portion of the lock member;

FIG. **10** is a partially-cutaway enlarged top-plan view of a slide fastener to which the slider for a slide fastener according to the present invention is attached, illustrating a state in which an insert pin of an opening member is inserted into the slider;

FIG. **11** is an enlarged cross-sectional view of a main part illustrating a state in which the insert pin comes in contact with an inclined surface of the claw portion;

FIG. **12** is an enlarged cross-sectional view of a main part illustrating a state in which the claw portion is pushed up by the insert pin;

FIG. **13** is an enlarged top-plan view of a main part illustrating a state in which a pair of right and left fastener tapes is moved and right and left fastener elements are engaged with each other;

FIG. **14** is an exploded perspective view illustrating a second embodiment of the slider for a slide fastener according to the present invention;

FIG. **15** is a vertical cross-sectional view of the slider for a slide fastener shown in FIG. **14** in a state in which a pull-tab is not mounted; and

FIG. **16** is a perspective view of a lock member of the slider with an automatic stop function in which a pull-tab cannot be attached to or detached from a body.

EMBODIMENTS OF INVENTION

Hereinafter, embodiments of a slider for a slide fastener according to the present invention will be described in detail with reference to the accompanying drawings. In the following description, an upper side refers to an upper side with respect to the paper surface of FIG. **2**, a lower side refers to a lower side with respect to the paper surface of FIG. **2**, a front side refers to a left side with respect to the paper surface of FIG. **2**, a rear side refers to a right side with respect to the paper surface of FIG. **2**, a right side refers to a far side with respect to the paper surface of FIG. **2**, and a left side refers to a near side with respect to the paper surface of FIG. **2**. In addition, the right and left direction of the slider is also referred to as a width direction.

First Embodiment

First, a first embodiment of the slider for a slide fastener according to the present invention will be described with reference to FIG. **1** to FIG. **13**.

The slider **10** for a slide fastener according to this embodiment is a slider with an automatic stop function in which a pull-tab can be attached to and detached from a body. As shown in FIG. **1** and FIG. **2**, the slider **10** has a body **20** which includes an upper blade **21** and a lower blade **22** which are spaced apart from each other in the upward and downward direction so as to be disposed in parallel to each other, a guide post **23** which connects the front end portion of the upper blade **21** to the front end portion of the lower blade **22**, upper flanges **24***a* which protrude downward along right and left side edges of the upper blade **21**, and lower flanges **24***b* which protrude upward along right and left side edges of the lower blade **22**. Due to this configuration, right and left shoulder mouths **25** which are separated by the guide post **23** are formed in the front portion of the body **20**, and a rear mouth **26** is formed in the rear portion of the body **20**. In addition, an element guide path **27** which is formed into a substantially Y-shape is formed between the upper blade **21** and the lower blade **22** to communicate the right and left shoulder mouths **25** with the rear mouth **26**. The element guide path **27** constitutes a path into which a pair of right and left fastener element rows **82** shown in FIG. **13** is inserted.

In addition, the slider **10** for a slide fastener includes a lock member **40**, a cover member **50** and an opening/closing member **60**. The lock member **40** is supported by a pillar portion **31** so as to be swingable up and down, the pillar portion **31** being erected on the front end portion of the upper surface of the upper blade **21**. The cover member **50** is attached to the upper blade **21** in a cantilever manner, with a front end portion thereof being fixed to the front end portion of the upper surface of the upper blade **21**. The cover member **50** covers the pillar portion **31** and the lock member **40** from above. The opening/closing member **60** is formed between the rear end portion of the cover member **50** and the upper blade **21**, and is configured to open/close a gap S (hereinafter referred to as "insert gap S") into which a shaft portion **15***a* of the pull-tab **15** is inserted.

The pillar portion **31** has right and left wall portions **31***a*, **31***b* which are spaced apart from each other at a gap into which the lock member **40** can be fitted, and a support convex portion **32** which is formed between the right and left wall portions **31***a*, **31***b*.

As shown in FIG. **2** to FIG. **4**, the lock member **40** has a body portion **40***a* which is disposed on the upper surface of the upper blade **21**. The body portion **40***a* has a base portion **41** which is supported by the pillar portion **31** of the body **20**, and an upper piece portion **42** and a lower piece portion **43** which respectively extend rearward from the base portion **41** and are disposed so as to face each other in the upward and downward direction. In addition, an operation recess portion **44** is formed between the upper piece portion **42** and the lower piece portion **43**. The operation recess portion **44** is opened toward the rear mouth **26** to accommodate the shaft portion **15***a* of the pull-tab **15** in an attachment state. In addition, a claw portion **45** which is directed downward is provided at the front end portion of the lower piece portion **43**. The claw portion **45** is configured to enter the element guide path **27** through a claw hole **33** formed in the upper

blade **21**. A support concave portion **41***a* which is swingably supported by the support convex portion **32** of the pillar portion **31** is formed in the lower surface of the base portion. The claw hole **33** penetrates from the upper surface of the upper blade **21** to the element guide path **27**.

As shown in FIG. **3** to FIG. **5**, an inclined surface **46** is formed on the right side surface of the claw portion **45** of the lock member **40**. The inclined surface **46** is inclined so as to approach from the right side surface to the left side surface of the claw portion **45**, and causes the claw portion **45** to be gradually tapered toward the front end of the claw portion **45**. Due to this configuration, as shown in FIG. **10** to FIG. **12**, when an insert pin **88** of an opening member (separable end stop) **85** of a slide fastener **80** is inserted into the slider **10**, the insert pin **88** comes into contact with the inclined surface **46**, so that the claw portion **45** is pushed up by the insert pin **88**.

As shown in FIG. **10**, the slide fastener **80** includes a pair of right and left fastener tapes **81**, a pair of right and left fastener element rows **82** respectively provided on opposing tape side edge portions **81***a* of the pair of right and left fastener tapes **81**, the pair of right and left fastener element rows **82** each having a plurality of fastener elements **82***a*, the slider **10** according to the present invention which is configured to engage and disengage the pair of right and left fastener element rows **82** with and from each other, and the opening member **85** which is formed at the lower end portions of the tape side edge portions **81***a* of the pair of right and left fastener tapes **81**.

The opening member **85** includes a box pin **86** and a box body **87** which are formed at the lower end portion of the tape side edge portion **81***a* of the left fastener tape **81**, and the insert pin **88** which is formed at the lower end portion of the tape side edge portion **81***a* of the right fastener tape **81**. The insert pin **88** can be inserted into the box body **87**. Although this embodiment employs the opening member **85** as the separable end stop, this is not intended to be limiting. A reverse opening member which includes a box pin and an insert pin may be employed in place of the opening member **85**.

As shown in FIG. **3** to FIG. **5**, a stepped portion **47** is formed on the left side surface of the claw portion **45** of the lock member **40**. The stepped portion **47** is concave from the left side surface toward the right side surface of the claw portion **45**, and causes the plate thickness W**2** of the claw portion **45** to be smaller than the plate thickness W**1** of the body portion **40***a*. Accordingly, as shown in FIG. **13**, when the right and left fastener elements **82***a* engage with each other in response to sliding of the slider **10**, the claw portion **45** is prevented from contacting the left fastener elements **82***a* (which are not engaged with the claw portion **45**).

According to this embodiment, as shown in FIG. **5**, in a protruding direction of the claw portion **45** (in the upward and downward direction), the formation area A**1** of the stepped portion **47** is set to be greater than the formation area A**2** of the inclined surface **46**. Specifically, in the upward and downward direction of the lock member **40**, the formation area A**1** of the stepped portion **47** extends from the front end of the claw portion **45** to a position close to a base end of the claw portion **45** (a boundary portion between the lower piece portion **43** and the claw portion **45**), whereas the formation area A**2** of the inclined portion **46** is limited to a position close to the front end of the claw portion **45**. The size of the formation area A**1** is preferably 1.5 to 2.5 times the formation area A**2**.

As shown in FIG. **1** and FIG. **2**, the cover member **50** has a top plate **51** which is bent so as to be convex upward, a pair of right and left side plates **52** extending downward from both side edges of the top plate **51**, a front plate **53** extending downward from the front end portion of the top plate **51**, and a rear plate **54** extending downward from the rear end portion of the top plate **51**. A retracting portion **55** and a pull-tab accommodating portion **56** are provided at the lower end surfaces of the pair of right and left side plates **52** in the middle portion of the cover member **50**. The retracting portion **55** and the pull-tab accommodating portion **56** are configured so as to be concave downward and face toward the body **20**. A protrusion **57** extending downward is formed between the retracting portion **55** and the pull-tab accommodating portion **56**.

In addition, fitting pieces **58** are respectively formed on the lower end portion of the pair of right and left side plates **52** at the front end side of the pair of right and left side plates **52**. The fitting pieces **58** are fitted into fitting recesses **34** which are formed in the front end portion of the upper blade **21**. In addition, when the fitting pieces **58** are fitted into the fitting recesses **34** and the pair of right and left side plates **52** are crimped into the recesses **31***c* which are formed in the outer side surfaces of the right and left wall portions **31***a*, **31***b* of the pillar portion **31**, the cover member **50** is attached to the body **20** in a cantilever manner along the front-rear direction, with the front end portion thereof being fixed to the front end portion of the upper blade **21**. In addition, the fitting recesses **34** are respectively formed at the right and left of the pillar portion **31**, and extend in the front-rear direction of the body **20**. The fitting pieces **58** protrude sideward from the lower ends of the pair of right and left side plates **52** of the cover member **50**.

A rectangular leaf spring **70** which urges the claw portion **45** of the lock member **40** so as to enter the element guide path **72** is provided between the lock member **40** and the cover member **50**. The front and rear end portions of the leaf spring **70** are respectively provided with engagement recess portions **71**. When the front and rear engagement recess portions **71** are engaged with engagement convex portions **51***a* which are formed on the front and rear portions of the top plate **51** of the cover member **50**, the leaf spring **70** is mounted inside the cover member **50**. The engagement convex portions **51***a* are disposed inside the cover member **50** (i.e. inside the space surrounded by the top plate **51**, the pair of right and left side plates **52**, the front plate **53** and the rear plate **54**).

The opening/closing member **60** has a first closing portion **61**, second closing portion **62** and a valley portion **63**, as shown in FIG. **1** and FIG. **2**. The first closing portion **61** is formed into a substantially U-shape when viewed in a top plan view so as not to contact with the lock member **40** in a state in which the opening/closing member **60** is attached to the body **20**, is formed on the rear end portion of the opening/closing member **60**, and is formed into a substantially trapezoidal shape when viewed from the side. The second closing portion **62** is formed on the front end portion of the opening/closing member **60**, and is formed into a substantially trapezoidal shape when viewed from the side. The valley portion **63** is provided between the first closing portion **61** and the second closing portion **62**.

The lower end portions of both side surfaces of the opening/closing member **60** are respectively formed with guide portions **64** which are slidably fitted into guide recesses **35** which are formed along the front-rear direction in the upper surface of the upper blade **21** at the rear portion of the upper blade **21**. Due to this configuration, the opening/closing member **60** is provided so as to be slidable in the front-rear direction with respect to the body **20**. In addition,

a coil spring **12** is provided in a compressed manner between the front end portion of the opening/closing member **60** and a spring-maintaining recess **35***a* which is formed inside the guide recess **35**. The opening/closing member **60** is constantly urged toward the rear mouth **26** by an urging force of the coil spring **12**.

A pair of right and left stoppers **36** is formed on the rear end portion of the upper surface of the upper blade **21**. The stoppers **36** are configured to stop the opening/closing member **60** at a gap closing position where the insert gap S is closed and to prevent the opening/closing member **60** from being disengaged from the guide recess **35**. When the opening/closing member **60** slides toward a gap opening position where the insert gap S is opened and the shaft portion **15***a* of the pull-tab **15** is inserted into the insert gap S, the shaft portion **15***a* is accommodated inside the operation recess portion **44** of the lock member **40**.

Next, referring to FIG. **6** to FIG. **9**, a description will be given below of the sequence of attaching the pull-tab **15** to the slider **10** for a slide fastener.

First, as shown in FIG. **6**, when the shaft portion **15***a* of the pull-tab **15** is pushed into the insert gap S from rear to front, the opening/closing member **60** slides forward so that the shaft portion **15***a* of the pull-tab **15** is retracted into the retraction portion **55** of the cover member **50**. Then, as shown in FIG. **7**, the opening/closing member **60** slides rearward so that the shaft portion **15***a* of the pull-tab **15** enters the valley portion **63** between the first closing portion **61** and the second closing portions **62** of the opening/closing member **60**.

Afterwards, as shown in FIG. **8**, when the shaft portion **15***a* of the pull-tab **15** is pushed further forward in the insert gap S, the opening/closing member **60** slides forward so that the shaft portion **15***a* of the pull-tab **15** enters the pull-tab accommodating portion **56** of the cover member **50** while pushing up the lock member **40**. Then, as shown in FIG. **9**, the opening/closing member **60** slides rearward so that the shaft portion **15***a* of the pull-tab **15** is accommodated inside the operation recess portion **44** of the lock member **40**.

In the slider **10** for a slide fastener configured as above, when the insert pin **88** of the opening block **85** is inserted into the slider **10** as shown in FIG. **10**, an angled portion of the insert pin **88** comes into contact with the inclined surface **46** of the claw portion **45** as shown in FIG. **11** and FIG. **12**, so that the claw portion **45** is pushed up by the angled portion of the insert pin **88**. Consequently, since the claw portion **45** is pushed up when the insert pin **88** is inserted into the slider **10**, the operability for closing the opening member **85** is improved.

In addition, as shown in FIG. **13**, in the finishing process of the slide fastener **80**, when the pair of right and left fastener tapes **81** are moved and the slider **10** slides (in the finishing process, the slider **10** is fixed by a jig, and the fastener tape **81** side is moved by a transportation apparatus), the right and left fastener elements **82***a* are engaged with each other in the element guide path **27**. At this time, the stepped portion **47** of the claw portion **45** prevents the claw portion **45** from coming into contact with the left fastener elements **82***a*. Accordingly, it becomes possible to move the pair of right and left fastener tapes **81** without pushing up the lock member **40**, and thus it is not required to separately provide a lock-releasing device. In addition, as for the contact between the claw portion **45** and the right fastener elements **82***a*, the problem of obstructing the movement of the pair of right and left fastener tapes **81** does not occur, since the inclined surface in the front portion of the claw portion **45** allows the claw portion **45** to slide over the fastener elements **82***a* one after another in the direction in which the fastener elements **82***a* are engaged with each other.

As described above, according to the slider **10** for a slide fastener according to this embodiment, the inclined surface **46** which causes the claw portion **45** to be gradually tapered toward the front end of the claw portion **45** is formed on the right side surface of the claw portion. Due to this configuration, when inserting the insert pin **88** into the slider **10**, the insert pin **88** comes into contact with the inclined surface **46**, thereby pushing up the claw portion **45**. This can consequently improve the operability for closing the opening member **85**.

In addition, the stepped portion **47** is formed on the left side surface of the claw portion **45** of the lock member **40** such that the plate thickness W**2** of the claw portion **45** is smaller than the plate thickness W**1** of the body portion **40***a*. Due to this configuration, the claw portion **45** is prevented from contacting the left fastener elements **82***a*. Consequently, it is possible to engage the right and left fastener elements **82***a* with each other without providing the lock-releasing device, thereby reducing the manufacturing cost of the slide fastener **80**.

Furthermore, according to the slider **10** for a slide fastener according to this embodiment, the claw portion **45** is formed with the inclined surface **46** and the stepped portion **47**, and the claw portion **45** is taper-shaped. Consequently, when engaging the claw portion **45** and the fastener elements **82***a* with each other, it is possible to facilitate inserting the claw portion **45** into the narrow gap between the right and left fastener element rows **82***a* to be engaged with each other.

In addition, according to the slider **10** for a slide fastener according to this embodiment, even though the plate thickness W**2** of the claw portion **45** is decreased due to the stepped portion **47**, the strength of the body portion **40***a* can be maintained since the plate thickness W**1** of the body portion **40***a* of the lock member **40** (the base portion **41**, the upper piece portion **42** and the lower piece portion **43**) stays thick.

Second Embodiment

Next, referring to FIG. **14** and FIG. **15**, a description will be given below of a second embodiment of the slider for a slide fastener according to the present invention. The same reference numerals and signs will be used in the drawings in order to designate some components when they are the same as or like to those of the first embodiment, and descriptions of those components will be omitted or simplified.

According to this embodiment, as well as the foregoing first embodiment, an inclined surface **46** is formed on the right side surface of a claw portion **145** of a lock member **140** of the slider **110** for a slide fastener and a stepped portion **47** is formed on the left side surface of the claw portion **145**, as shown in FIG. **14** and FIG. **15**.

The slider **110** for a slide fastener is a slider with an automatic stop function in which a pull-tab can be attached to and detached from a body. As shown in FIG. **14** and FIG. **15**, the slider **110** has a body **120** which includes an upper blade **121** and a lower blade **122** which are spaced apart from each other in the upward and downward direction so as to be disposed in parallel to each other, a guide post **123** which connects the front end portion of the upper blade **121** to the front end portion of the lower blade **122**, upper flanges **124***a* which protrude downward along right and left side edges of the upper blade **121**, and lower flanges **124***b* which protrude upward along right and left side edges of the lower

blade **122**. Due to this configuration, right and left shoulder mouths **125** which are separated by the guide post **123** are formed in the front portion of the body **120**, and a rear mouth **126** is formed in the rear portion of the body **120**. In addition, an element guide path **127** which is formed into a substantially Y-shape is formed between the upper blade **121** and the lower blade **122** to communicate the right and left shoulder mouths **125** with the rear mouth **126**. The element guide path **127** constitutes a path into which a pair of right and left fastener element rows **82** is inserted.

In addition, the slider **110** for a slide fastener **130** includes a lock member **140**, a cover member **150**, a pin **111** and an opening/closing member **160**. The lock member **140** is supported by a pillar portion **131** so as to be swingable up and down, the pillar portion **131** being erected on the front end portion of the upper surface of the upper blade **121**. The cover member **150** covers the pillar portion **131** and the lock member **140** from above. The pin **111** penetrates through the pillar portion **131**, the lock member **140** and the cover member **150**, and acts as the center of rotation of the lock member **140**. The opening/closing member **160** is formed between the rear end portion of the cover member **150** and the upper blade **121**, and is configured to open/close an insert gap S into which a shaft portion **15***a* of the pull-tab **15** is inserted.

The pillar portion **131** has right and left wall portions **131***a* and **131***b* which are spaced apart from each other at a gap into which the lock member **140** can be fitted. The right and left wall portions **131***a* and **131***b* are respectively formed with pin insert holes **131***c* into which the pin **111** is inserted.

As shown in FIG. **14** and FIG. **15**, the lock member **140** has a body portion **140***a* which is disposed on the upper surface of the upper blade **121**. The body portion **140***a* has a base portion **141** which has a pin insert hole **141***a* into which the pin **111** is inserted, and an upper piece portion **142** and a lower piece portion **143** which respectively extend rearward from the base portion **141** and are disposed so as to face each other in the upward and downward direction. In addition, an operation recess portion **144** is formed between the upper piece portion **142** and the lower piece portion **143**. The operation recess portion **144** is opened toward the rear mouth **126** to accommodate the shaft portion **15***a* of the pull-tab **15** in an attachment state. In addition, a claw portion **145** which is directed downward is provided at the front end portion of the lower piece portion **143**. The claw portion **145** is configured to enter the element guide path **127** through a claw hole **133** formed in the upper blade **121**. The claw hole **133** penetrates from the upper surface of the upper blade **121** through the element guide path **127**.

As shown in FIG. **14** and FIG. **15**, the cover member **150** has a top plate **151** which is bent so as to be convex upward, a pair of right and left side plates **152** extending downward from both side edges of the top plate **151**, a front plate **153** extending downward from the front end portion of the top plate **151**, and a rear plate **154** extending downward from the rear end portion of the top plate **151**. A retracting portion **155** and a pull-tab accommodating portion **156** are provided at the lower end surfaces of the rear portion of the pair of right and left side plates **152**. The retracting portion **155** and the pull-tab accommodating portion **156** are configured so as to be concave downward and face toward the body **120**. A protrusion **157** extending downward is formed between the retracting portion **155** and the pull-tab accommodating portion **156**.

In addition, the lock member **140** is inserted between the right and left wall portions **131***a*, **131***b* of the pillar portion **131** and the pin **111** is inserted into the pin insert hole **141***a* of the lock member **140** and the pin insert holes **131***c* of the left and right wall portions **131***a*, **131***b*. Consequently, the lock member **140** is pivotably supported so as to be swingable up and down with respect to the body **120**. The pin **111** is inserted into through-holes **152***a* which are respectively formed in the pair of right and left side plates **152** of the cover member **150**, and the cover member **150** is fixed to the pillar portion **131** through the pin **111**.

As shown in FIG. **15**, the lock member **140** is urged by a first coil spring **112** which is embedded inside the slider **110** so that the claw portion **145** of the lock member **140** enters the element guide path **127**. Specifically, the first coil spring **112** is provided while being compressed, between a spring bearing surface **141***b* formed on the lower surface of the base portion **141** of the lock member **140** and a spring-holding hole **123***a* which is formed in the guide post **123**. The lock member **140** is constantly urged such that the lock member **140** swings about the pin **111** when the spring bearing surface **141***b* receives the urging force of the first coil spring **112** and such that the claw portion **145** protrudes into the element guide path **127** through the claw hole **133**. The spring bearing surface **141***b* is formed on a concave surface of the lock member **140**, that is upwardly concaved in a stepped manner, in the front and lower portion of the pin insert hole **141***a* of the base portion of the lock member **140**. The spring-holding hole **123***a* extends along the upward and downward direction of the slider **110**, and has a bottom surface on which the first spring **112** is to be placed.

The opening/closing member **160** has a first closing portion **161**, second closing portion **162** and a valley portion **163**, as shown in FIG. **14** and FIG. **15**. The first closing portion **161** is formed into a substantially U-shape when viewed in a top plan view so as not to contact with the lock member **140** in a state in which the opening/closing member **160** is attached to the body **120**, is formed on the rear end portion of the opening/closing member **160**, and is formed into a substantially trapezoidal shape when viewed from the side. The second closing portion **162** is formed on the front end portion of the opening/closing member **160**, and is formed into a substantially trapezoidal shape when viewed from the side. The valley portion **163** is provided between the first closing portion **161** and the second closing portion **162**.

The lower end portions of both side surfaces of the opening/closing member **160** are respectively formed with guide portions **164** which are slidably fitted into a guide recess **135** which is formed along the front-rear direction in the upper surface of the rear portion of the upper blade **121**. Due to this configuration, the opening/closing member **160** is provided so as to be slidable in the front-rear direction with respect to the body **120**. A second coil spring **113** is provided while being compressed, between the front end portion of the opening/closing member **160** and a spring-maintaining recess **135***a* which is formed inside the guide recess **35**. The opening/closing member **160** is constantly urged toward the rear mouth **126** by the urging force of the second coil spring **112**.

The rear end portion of the upper surface of the upper blade **121** is formed with a pair of right and left stoppers **136** which are configured to stop the opening/closing member **160** at a gap closing position where the insert gap S is closed while preventing the opening/closing member **160** from being disengaged from the guide recess **135**. When the opening/closing member **160** slides toward a gap opening position where the insert gap S is opened and the shaft portion **15***a* of the pull-tab **15** is inserted into the insert gap

S, the shaft portion **15***a* is accommodated inside the operation recess portion **144** of the lock member **140**.

The other configurations and the advantageous effects are the same as those of the first embodiment.

The present invention is not limited to those that were illustrated in the foregoing embodiments but can be suitably changed without departing from the concept of the present invention.

Although the foregoing embodiments of the present invention were illustrated being applied to a slider with an automatic stop function in which the pull-tab can be attached to and detached from the body, the present invention is not limited thereto. The present invention may be applied to a slider with an automatic stop function in which the pull-tab cannot be attached to and detached from the body. Such a type of slider is provided with a lock member **240** shown in FIG. **16**. The lock member **240** includes a body portion **240***a* which has a base portion **241** and a single arm portion **242** extending rearward from the base portion **241**, and a claw portion **245** which protrudes downward from the leading end portion of the arm portion **242**. An inclined surface **46** is formed on the right side surface of the claw portion **245**, and a stepped portion **47** is formed on the left side surface of the claw portion **245**.

DESCRIPTION OF REFERENCE NUMERALS

10, **110** Slider for Slide Fastener
20, **120** Body
27, **127** Element Guide Path
31, **131** Pillar Portion
40, **140** Lock Member
40 *a*, **140***a* Body Portion
45, **145** Claw Portion
46 Inclined Surface
47 Stepped Portion
50, **150** Cover Member
80 Slide Fastener
82 Fastener Element Row
82*a* Fastener Element
85 Opening Member (Separable End Stop)
88 Insert Pin
A1 Formation Area of Stepped Portion
A2 Formation Area of Inclined Surface
W1 Plate Thickness of Body Portion
W2 Plate Thickness of Claw Portion

The invention claimed is:

1. A slide fastener comprising:
a pair of fastener tapes;
a pair of fastener element rows respectively provided on opposing tape side edge portions of the pair of fastener tapes, the pair of fastener element rows each having a plurality of fastener elements;
a slider configured to engage and disengage the pair of fastener element rows with and from each other; and
a separable end stop including;
a box pin formed at one end portion of one of the tape side edge portions of one of the fastener tapes; and
an insert pin formed at one end portion of another of the tape side edge portions of another of the fastener tapes and which is configured to be inserted into an element guide path of the slider,
wherein the slider includes:
a body forming the element guide path;
a lock member which is swingably supported by a pillar portion which is erected on an upper surface of the body; and
a cover member which covers the pillar portion and the lock member from above,
wherein the lock member comprises a body portion which is disposed on the upper surface of the body and a claw portion which protrudes from the body portion and is configured to enter the element guide path of the body,
wherein the lock member has a plate shape comprising a first main surface and a second main surface opposite the first main surface and a thickness direction of the plate shape of the lock member is defined as a direction perpendicular to the first main surface and the second main surface,
wherein the lock member is attached to the body such that the thickness direction is oriented to a width direction of the slider,
wherein one side surface of the claw portion in the thickness direction is formed with an inclined surface which causes a plate thickness of the claw portion to be gradually tapered toward a tip end of the claw portion, and the insert pin of the separable end stop is configured to come into contact with the inclined surface of the claw portion and push up the claw portion when the insert pin is inserted into the element guide path, and
wherein another side surface of the claw portion in the thickness direction is formed with a stepped portion which causes the plate thickness of the claw portion to be smaller than the plate thickness of the body portion.

2. The slide fastener according to claim **1**, wherein a formation area of the stepped portion is greater than a formation area of the inclined surface in a protruding direction of the claw portion.

3. A slide fastener comprising:
a pair of fastener tapes;
a pair of fastener element rows respectively provided on opposing tape side edge portions of the pair of fastener tapes, the pair of fastener element rows each having a plurality of fastener elements;
a slider configured to engage and disengage the pair of fastener element rows with and from each other; and
a separable end stop including;
a box pin formed at one end portion of one of the tape side edge portions of one of the fastener tapes; and
an insert pin formed at one end portion of another of the tape side edge portions of another of the fastener tapes and which is configured to be inserted into an element guide path of the slider,
wherein the slider includes:
a body forming the element guide path;
a lock member which is swingably supported by a pillar portion which is erected on an upper surface of the body; and
a cover member which covers the pillar portion and the lock member from above,
wherein the lock member comprises a claw portion which is configured to enter the element guide path of the body,
wherein the lock member has a plate shape comprising a first main surface and a second main surface opposite the first main surface and a thickness direction of the plate shape of the lock member is defined as a direction perpendicular to the first main surface and the second main surface,
wherein the lock member is attached to the body such that the thickness direction is oriented to a width direction of the slider, and
wherein one side surface of the claw portion in the thickness direction is formed with an inclined surface,

and the insert pin of the separable end stop is configured to come into contact with the inclined surface of the claw portion and push up the claw portion when the insert pin is inserted into the element guide path.

4. The slide fastener according to claim **1**, wherein the plate thickness is substantially uniform in the body portion of the lock member.

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